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ABSTRACT

Social and affective objectives are being increasingly accepted as integral parts of the school curriculum. Generalization effects produced by a training program in classroom participation skills were analyzed for two classrooms of seventh-grade boys with reading, writing, and disciplinary problems. Subject, situation, and behavior variables were combined to study eight different types of post-treatment generalization. The first classroom of students (N=14) received regular classroom instruction. The second classroom was composed of two experimental groups, i.e., 7 students who participated in the training program and 7 students who were exposed only to training program students. Teachers and trained observers rated students on 19 specific behaviors occurring in French and mathematics classes before treatment, and at 1- and 3-month intervals after treatment. Results indicated that training in classroom participation skills modified the behavioral repertoire of both training and exposure groups. Findings suggest that understanding and anticipating diverse types of generalization effects is necessary to measure the total impact of intervention programs. (Author/NRB)

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GENERALIZATION EFFECTS: A PROSPECTIVE STUDY IN THE SCHOOL

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Social and affective objectives are receiving increasing acceptance as integral parts of the school curriculum. The efficacity of procedures for inducing or modifying social and affective behaviors among students has already been demonstrated (Cartledge & Milburn, 1978; O'Leary, 1978). The growing influence of these procedures, especially those of the behavior modification type, pose several ethical questions. For example, can interventions directed towards a particular behavioral target have undesirable side-effects on other parts of the students behavioral repertoire (Sajwaj, Twardosz et Burke, 1972), decrease adaptive behaviors, or establish nonadaptive behaviors (Willems, 1974)?

Willems (1974) and Marston (1979) suggest adopting an ecological approach that anticipates and avoids the consequences of intrusive generalization effects. Researchers have approached this problem by the somewhat circuitous route of studying the generalization of treatment effects. This approach determines if, in fact, interventions have positive or negative consequences on untargeted behaviors and persons.

Drabman, Hammer and Rosenbaum (1979) and Hayes, Rincover and Solnick (1980) have reviewed existing research concerned with generaliza-

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tion. The former elaborated a taxonomy of different types of generalization, then reviewed 13 behavior modification journals for the period of 1960-1977. They observed that several dimensions of generalization had not been studied at all such as, across-situations generalization for untargeted behaviors induced by treatment programs. Their study demonstrated the need for exploring all possible types of generalization.

Hayes, Rincover and Solnick (1980) reach similar conclusions after reviewing the first ten (10) volumes of the Journal of Applied Behavior Analysis. They observed that a few types of generalization, such as the maintenance of learning across time and situations, had received the most research attention. They report that 22% of their sample of studies referred to generalization across time, 32% to across-situations generalization, 13% to across-behaviors generalization and 3.4% to generalization across-individuals.

Stoke and Baer's (1977) definition of generalization lends itself well to the ecological perspective on behavioral interventions. They define generalization as the manifestation of any given behavior in conditions other than those of the treatment (i.e. across time, situations, individuals and within individuals). Furthermore, it is important to distinguish between within - and post-treatment generalization (Drabman, Hammer and Rosenbaum, 1979). The absence of scientific communications concerning several types of post-treatment generalization may in part be due to the relatively greater ease of studying within-treatment generalization. Post-treatment generalization has been treated as secondary to the preoc-

cupation with demonstrating short-term effects of interventions within specific problem areas. However, as the preceding discussion demonstrates, generalization, by itself, merits greater and more comprehensive scientific investigation.

The purpose of the present study, thus, was to see if effects of a training program in classroom participation skills would generalize to other parts of the behavioral repertoire of the trained individuals and the peers with whom they have contact. The types of generalization studied were those post-treatment aspects identified by Drabman, Hammer and Rosenbaum (1979) and Wildman and Wildman (1975). These types of generalization were derived from the possible paired combinations of the following variables: subjects, behaviors, situations and time.

METHOD

Subjects

Two classrooms of grade 7 boys, aged 12 to 14 years, with reading writing and disciplinary difficulties were chosen from within a middle-income French-speaking high school and suburban community. The Mathematics and French teachers for these two classes without knowing the purposes of the research and training program agreed to have classroom observations of the students made during the school year. The students were divided into three groups. The first classroom of students (N =14) constituted the control group. Using the pre-treatment observations so as to minimize differences in the nineteen target behaviors, students in the second class-

room were assigned to one of the two experimental groups. The training-experimental group (N =7) was chosen randomly from the two subgroups. One student was subsequently dropped from this group after being transferred to another school. The second subgroup (N =7) became the exposure experimental group. These students were exposed to training group subjects during regular classroom hours, except during the training sessions given to the training group.

Training Program

Over a period of one month the training group received a 12 hour training program in a room adjacent to their classroom. Training consisted of a structured educational approach aimed at training students to perform appropriate classroom participation skills in their French class. Target skills were defined in terms of the appropriate expression of approval and disapproval; and appropriate verbal and nonverbal participation. The intervention strategies were modified versions of those employed by Simon, Howe and Kirschenbaum (1972) and Stephens (1978). The target behaviors for each of the 12 training sessions are described in Table 1.

Insert Table 1 here

The two trainers presented situations and materials designed to make the student aware of the importance of target behaviors, provide opportunities to practice them and help the student anticipate situations where these behaviors would be useful. Both tangible and social reinfor-

cers (preferred school materials, money and praise) encouraged emission of the target behaviors during the French class. Training group subjects self-recorded on target behaviors between training sessions, receiving preferred reinforcers after remittance of each self-observation record sheet. Training subjects were aware that trainers would observe their training-targeted behaviors between sessions, giving them subsequent feed-back and encouragement (that their behavior would be monitored).

Systematic observation

Data on 19 behavioral categories were collected, using a systematic observation procedure developed by Loranger, Picard and Pomerleau (see Note 1). Observers received a three-phase training program: a) learning the behavioral categories to be rated with the use of a training manual (Note 1); b) rehearsal of rating behaviors using video-tapes; and c) in vivo rehearsal in the observation rooms equipped with one-way mirrors adjacent to each classroom. The six observers worked in systematically rotated pairs throughout pre-test, post-test and follow-up phases, making their observations in both French and Mathematics classes.

Observers made ratings every six seconds, distributing their observations systematically across subjects. A mean of 1150 observations were obtained for each student at each experimental phase approximately one-half for each class. Interrater reliability (number of agreements, divided by the number of agreements plus disagreements, all multiplied by 100) was greater than 81% at all phases.

Insert Table 2 here

A description of the behavioral categories rated by observers is presented in Table 2.

Teacher Ratings

The two teachers involved in the experiment evaluated their students' classroom behavior at pre-test and follow-up phases (three months after treatment). The questionaire used, the EPCEE (Note 2), consisted of 136 items validated par Milburn (1974) and recommended by Stephens (1978). The teachers responded on a five point rating scale to the following question: "Do you think that the student is the type of person who...". These 136 behaviors are divided into four behavioral categories and into thirty more-specific subcategories, presented in Table 3.

Insert Table 3 here

Experimental Design

Table 4 presents the design used for analysis of the various types of generalization, as well as the variables on which they are based. Each type of generalization was analyzed using pre-test, post-test and follow-up systematic observations as well as pre-test and follow-up teacher ratings.

Insert Table 4 here

Statistical Analysis

Nonparametric statistical analyses applied to the systematic observational data included, Friedman's two-way analysis of variance and the Sign Test (Siegel, 1956). Results from the EPCEE were treated by prediction and covariance analysis (version 5.3) of the National Educational Resources Computer Program (Note 3).

RESULTS

Systematic observations

Data on the behavior categories listed in Table 2 were used to analyze the different forms of post-treatment generalization. As can be noted in Table 5, two new categories appear and some are clustered. TP, represents a total participation score calculated by grouping together the whole categories (AG, AC, CGD, VP and NVP) within the intervention program's objectives. AD, is an approval/disapproval score, calculated by grouping AG, AC and CGD. The following similar categories were grouped because of their relatively low frequency of occurrence: GW with IW; GI with CI and UBG with IOI.

Insert Table 5 here

Table 5 presents X^2_R values in the Friedman two-way analysis of variance for the 15 behavior categories and three groups of subjects in both French and Mathematics classes. X^2_R values indicate the level of

differences existing between behavior categories in each classroom. Only the category of inappropriate interaction with the teacher (IIT) showed nonsignificant differences for both classrooms situations.

This level of analysis did not permit determination of whether X^2_R differences were specific to the experimental group, nor at what phases of the experiment they occurred. These questions were analyzed using the Sign Test. Table 6 presents Sign Test results for those behavior categories showing significant differences across groups, phases and situations (French and Mathematics). Changes observed in the control group were attributed to non-experimental effects within the normal classroom situation. Departures from the control group's profile, thus, were taken as indicative of experimentally induced effects. In other words, significant differences in either experimental group not found for the control group, or vice-versa, were attributed to training and generalization effects.

1. Training group in French class.

1.1 French pre-to post-test, the training group significantly increased its appropriate interactions with teachers (TC+)* and its group and individual work behaviors (GW/IW+). However, its appropriate-visual orientation diminished in class (AOC-). Unlike the control group, the training group did not decrease its inappropriate visual orientation during class and individual work (UBG/IO-).

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* +and - signs indicate respectively, increases and decreases in the frequency of emitted behaviors.

1.2 From post-test to follow-up, the training group decreased in total participation (TP$^-$), as well as in approval and disapproval behaviors (AD$^-$). The training group did not make the following changes observed in the control group: decreases in disordering behavior (DB$^-$), group and individual work behavior (GW/IW$^-$) and appropriate visual-orientation in class (AOC$^-$); and increased appropriateness of peer-group interactions (GI/CI$^+$).

1.3 Comparing pre-test and follow-up measures, the training group interacted more appropriately with teachers (TC$^+$) and improved group and individual work behaviors (GW/IW$^+$), but their visual-orientation was less appropriate on group and individual tasks (UBG/IOI$^+$). Unlike the control group, the training group did not exhibit less non-verbal participation (NVP$^-$), nor more appropriate peer interactions (GI/CI$^+$).

2. Exposure group in French class.

2.4 From pre to post-test, the exposure group increased in appropriate peer interactions (GI/CI$^+$), as well as in group and individual work behaviors (GW/IW$^+$). However, appropriate visual-orientation (AOC$^-$) and ordering behaviors (OB$^-$) diminished. Unlike the exposure group, the controls became less appropriate in their visual orientation at this phase (UBG/IOI$^-$).

2.5 Between post-test and follow-up the exposure group's profile differs from that of the control group: i.e. increased peer interaction (GI/CI$^+$) and inappropriate visual orientation (UBG/IOI$^+$), and decreased

disordering behavior (DB⁻), group and individual group work (GW/IW⁻) and appropriate visual-orientation (AOC-).

2.6 Between pre-test and follow-up, the exposure-group diminished in appropriate visual-orientation (AOC⁻). Unlike controls, they did not decrease in group and individual work (GW/IW⁻), in non-verbal participation (NVP⁻), nor increase in appropriate peer interactions (GI/CI⁺).

3. Training group in mathematics class.

3.7 From pre to post-test, training subjects exhibited more disordering behavior (DB+). Unlike controls, they did not diminish in inappropriate peer interactions (IPI⁻) and in contacts with the teacher (TC⁻).

3.8 From post-test to follow-up, the training group increased in inappropriate visual-orientation in class (IOC⁺) and decreased in appropriate peer interactions (GI/CI⁻). Unlike controls, however, no increases in inappropriate peer interactions (IPI+) were observed.

3.9 From pre-test to follow-up, training subjects increased in total classroom participation (TP⁺), approval and disapproval behavior (AD+), and in classroom verbal participation (VP+). Unlike controls, no decreases in inappropriate peer interactions (IPI-) teacher contact behaviors (TC⁻), nor increases in note-taking (CN⁺) were observed.

4. Exposure group in mathematics.

4.10 From pre to post-test, exposure subjects, unlike controls, showed no decreases in inappropriate peer interaction (IPI-), teacher contact be-

haviors (TC) and group and individual work (GW/IW-).

4.11 From post-test to follow-up, total participation increased (TP+), while appropriate group and class interactions with peers decreased (GI/CI⁻). Unlike controls, increased inappropriate peer interactions (IPI+), and decreased group and individual work (GW/IW⁻) were not observed among exposure subjects.

4.12 From pre-test to follow-up, increases in two categories of participation were observed: approval and disapproval behaviors (AD_+) and verbal participation (VP+). Teacher-contact (TC⁻), group and individual work behaviors (GW/IW-) decreased for controls, but not for exposure subjects.

Teacher ratings

Certain categories of behaviors (group 1, 207 and 306 in Table 3) were eliminated from the teacher questionaire, because they referred to extra- class situations, inaccessible to these teachers' observation. This left five classes of behavior at both pre-test and follow-up phases for statistical analysis: the first class, treatment variables is composed of the four subcategories of table 3 marked "C" and some items in subcategories marked "P". The second class, treatment-related variables, was composed of subcategories marked "P", retaining at least fifty percent of their items. Interpersonal, self and task-related classes are the remaining three behavior variables. Pre-test and follow-up measures, French and Mathematics teachers' data considered independently, were first submitted to correlational analyses. Results of this analysis are presented in Table 7.

Insert Table 7 here

In the French class, treatment, task-related and interpersonal variables met prerequisites for the covariate analysis. In mathematics class, treatment and treatment-related variables satisfied these conditions. Table 8 presents covariate analysis results for the above mentioned classes of behavior.

Insert Table 8 here

No significant group differences were found among the three behavior classes in the French situation. Differences between control and training groups in the Mathematics situation were significant for both treatment and treatment-related variables. Training subjects improved on behaviors targeted by the training program, while controls did not. Similar differences in the same direction were noted for treatment-related variables, especially for "performance in front of others" ($p < .0045$). No differences between exposure and control groups were found.

DISCUSSION

Teacher and observer ratings are only partially consistent. From pre-test to follow-up, the mathematics teacher's and observers' ratings coincide for the training group, but not for the exposure group. The French teacher's ratings did not detect generalization effects from pre-test to follow-up.

Generalization effects are, nevertheless, indicated by teacher and observer results, as presented in Tables 6 and 8. Several important modifications in students' behavioral repertoires, beyond behaviors targeted by the training program, can be observed. This underlines the importance of the recommendation made by other writers (O'Leary, 1978; Sajwaj et al., 1972; Wildman and Wildman, 1975), suggesting the need for measuring certain behaviors not targeted by intervention programs.

Thus, depending on the situation and timing, an intervention program, planned to produce specified behavioral effects, can also induce inappropriate ones. Results of the present study support Willems (1974) and Marston's (1979) recommendation to adopt an ecological approach within behavior modification programs. Results presented in Tables 6 and 8 will now be discussed in terms of the various types of generalization effects outlined in Table 4.

1. Within individual generalization.

1.1 Within behavior-within situation generalization was studied by observing if the tratment program led to a higher level of classroom participation behaviors among training group subjects in the French class. The results obtained do not firmly demonstrate this type of generalization. From post-test to follow-up, participation behaviors had diminished as did their approval behaviors. On the other hand, training subjects nonverbal paritipation, contrary to controls, did not diminish from pre-test to follow-up. The latter result provided some support for the presence of this type of generalization.

1.2 Within behavior-across situation generalization determined whether the treatment program increased the training group's participation during Mathematics class. Both teacher and systematic observation measures confirmed increased participation from pre-test to follow-up among training subjects. This generalization was not significant from pre to post-test, perhaps, because generalization effects may not always "surface" immediately after treatment.

1.3 Within situation-across behaviors generalization was studied by seeing if, excluding participation behaviors, the training program affected training subjects' behaviors in French class. Results confirm that untargeted behaviors were affected by the training program. Teacher-contact, individual and group work, and appropriate visual-orientation behaviors showed improvements at both post-test and follow-up assessments. Inappropriate visual-orientation also increased from pre-test to follow-up. Other changes in the control group's behavior, not shown in that of the training group also indicate the presence of this type of generalization.

1.4 Across behaviors-across situations generalization focused on untargeted behaviors of trainings subjects in Mathematics class. Teacher ratings showed changes in training-related behaviors, particularly in "performance in front of others." Systematic observation results also point to the presence of this type of generalization. An increase in disordering behavior occured between pre-and post-test evaluations. From post-test to follow-up, increased inappropriate visual-orientation and decreased appropriate peer interactions were also observed. Dissimilarities in training and control group profiles also indicate the presence of this type of generalization.

2. Across individuals generalization.

2.5 Within behavior-within situation generalization was studied by seeing if participation behaviors were altered in the exposure group in the French class. This type of generalization is not supported by the present results. However, unlike the control group, the exposure group did not decrease in nonverbal participation, which may provide some evidence of this type of generalization.

2.6 Within behavior-across situations generalization was checked by seeing if participation behaviors were modified among exposure group subjects in Mathematics class. Systematic observation results confirm the presence of this type of generalization. The exposure group's global participation increased from post-test to follow-up, as did their approval and disapproval behaviors and verbal participation from pre-test to follow-up.

2.7 Across behavior-within situation generalization was examined by looking for changes in untargeted behaviors of exposure group subjects in French class. Its presence is indicated by systematic observation results. Between pre-test and post-test, increases in appropriate interaction with peers, in task-related behavior and inappropriate visual-orientation were observed. Inappropriate visual-orientation and ordering behaviors decreased during the same phase. The former effect was the only one that was maintained to the time of follow-up. Several changes noted in the control group were not found for the exposure group.

2.8 Across behavior-across situations generalization was tested by looking for changes in untargeted behaviors of the exposure group in Mathematics class. Its presence was supported only by decreases in appropriate class and group interactions with peers, between post-test and follow-up. Control group behavioral changes were not found for the exposure group. These changes include less group and individual work at each phase; from pre-to post-test and pre-test to follow-up, fewer teacher contacts; from pre-to post-test, fewer inappropriate peer interactions; from post-test to follow-up, greater inappropriate peer interaction.

Generalization across time

The study of generalization across time overlaps with other types of generalization, since they also take into account post-test to follow-up results. Except for disordering behavior in Mathematics, training group behavioral changes observed at post-test were maintained at follow-up in both French and Mathematics classes. Other behavioral changes appeared for the first time at follow-up, namely those of individual and group work in French and approval, nonverbal and total participation in Mathematics.

For the exposure group in French and Mathematics, the only behavioral change found at post-test and maintained until follow-up was that of decreased appropriate visual orientation in French. Behavioral changes appearing for the first time at follow-up were: approval and verbal participation in Mathematics. Thus, generalization across time was observed for both experimental groups, but espacially so for the training group.

Learning situations and behavior.

Some changes in behavior were noted in all groups at equivalent phases of assessment. For example, from post-test to follow-up, all groups increased in note-taking behaviors both in French and Mathematics; and, from pre-test to post-test, all groups increased in appropriate visual-orientation in Mathematics class. The learning situation contains pedagogical structures and directives which are likely to have induced such across-group changes. These similarities were most evident in the Mathematics class.

Participation behaviors of the training group in French class were unaffected by the training program. It is possible that, since teachers were uninformed of treatment objectives, the classroom situation did not permit expression of learned behavior. On the other hand, the Mathematics situation appears the most consistent with this view. These results put into perspective the importance of the situation for the expression of learned behavior.

This study contained some limitations worth mentioning. First of all, it studied within-group changes in behavior, without making across-groups statistical comparisons. Secondly, many significant differences were found in the systematic observation data. This could be due to the interdependence of several behavioral categories, because changes in one measure necessarily implied changes in other measures. While this fact does not negate the wealth of evidence supporting the presence of generalization effects, it does increase the frequency of significant comparisons and,

thus, poses the possibility of some "false-positives.

This study confirms the presence of several types of generalization effects, previously discussed by Drabman, Hammer and Rosenbaum (1979). Empirical results for several of these types of generalization are presented for the first time in the research literature. Finally, this study demonstrates that understanding and anticipation of diverse types of generalization effects is necessary in order to measure the total impact of intervention programs.

NOTES

1. Loranger, M., Picard, L., and Pomerleau, C. Manuel d'entraînement à l'observation en classe. Commission régionale Jean-Talon, Services aux étudiants, 335, 76e Rue ouest, Charlesbourg, Québec, Canada, G1H 4R4.

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TABLE 1

Participation behavior objectives for each of the 12 training program sessions.

1. Raising the hand and waiting quietly for teacher permission to speak (NVP)*.
2. Watch, listen, respond and volunteer (VP, NVP).
3. Ignore distractions; polite refusal to respond to others remarks (CGD).
4. Appropriate expression of requests, using "please" and "thank-you" (VP, NVP).
5. Express verbal/nonverbal approval to peers and teachers (AG, AC).
6. Read aloud clearly and summarize (VP).
7. Compliment others; reward others for acting appropriately (AG, AC).
8. Talk positively about oneself (VP).
9. Excuse oneself when bothering another (VP).
10. Ask questions to clarify understanding of lessons (VP).
11. Participate in discussions by making relevant comments (VP).
12. When appropriate to do so, participate by expressing disagreement (VP, CGD).

* abbreviations in parantheses refer to systematic observation behavioral categories, listed in Table 2.

TABLE 2

Behavioral categories with abbreviated definitions used for making systematic observations in class.

1.	AC	(approval in class) appropriate verbal/nonverbal expression of approval to another in class.
2.	AG	(approval in group) giving verbal/nonverbal approval to another student during group work.
3.	AOC	(appropriate visual-orientation in class)
4.	CGD	(class-group disapproval) appropriate verbal/nonverbal expression of disapproval to teacher or peers.
5.	CI	(class interaction) appropriate academic interaction, verbal or nonverbal, with other students in class.
6.	CN	(class notetaking) during all academic work.
7.	DB	(disordering behavior) having negative impact on social or material classroom environment.
8.	GI	(group interaction) academic interaction with teacher or members of group.
9.	GW	(group work) individual work within a group project.
10.	IIT	(inappropriate interaction with teacher) verbal or nonverbal.
11.	IOC	(inappropriate visual-orientation in class).
12.	IOI	(inappropriate visual-orientation during individual work).
13.	IPI	(inappropriate peer interaction) verbal or nonverbal.
14.	IW	(individual work) of academic nature.
15.	NVP	(nonverbal participation) during class academic work.
16.	OB	(ordering behavior) behavior aimed at improving or maintaining the class environment.
17.	TC	(teacher contact) appropriate verbal/nonverbal contact during individual work only.
18.	UBG	(uncooperative behaviors in group) including inappropriate visual-orientation.
19.	VP	(verbal participation) during class academic work.

TABLE 3

Description of behavioral categories and subcategories in the teacher questionaire, indicating those which are completely (C) or partially (P) concerned with the training program's objectives.

1. environment-related behaviors
   - 101: neatness
   - 102: reaction to emergencies
   - 103: cafeteria behavior
   - 104: movement in the environment

2. interpersonal behaviors
   - 201: acceptance of authority
   - 202: reaction to conflict
   - 203: way of attracting attention (C)
   - 204: greeting others (P)
   - 205: helping others
   - 206: way of maintaining conversation
   - 207: behavior during organized games
   - 208: positive attitudes toward peers (C)
   - 209: behavior during informal games
   - 210: treatment of own/others' property

3. behaviors related to self
   - 301: accepting consequences
   - 302: ethical behavior
   - 303: expression of feelings
   - 304: positive attitudes towards self (P)
   - 305: responsible behavior
   - 306: hygiene

TABLE 3 (CONTINUED)

Description of behavioral categories and subcategories in the teacher questionaire, indicating those which are completely (C) or partially (P) concerned with the training program's objectives.

4. task-related behaviors

401: asking and responding to questions (C)

402: behaviors related to attention

403: discussion in class (C)

404: finishing tasks once started

405: following directions

406: group work

407: individual work

408: behavior during the task

409: behavior in front of others

410: quality of work

TABLE 4

Schematic typology of generalization effects, as a function of groups (training, exposure and control), behaviors (participation and others*), and situations (French and Mathematics) at pre-test, post-test and follow-up phases.

	Group			Behavior		Situation	
	T.	E.	C.	Part.	Others	French	Math.
1. Within individual							
1.1 within behavior-within situation	X		X	X		X	
1.2 within behavior-across situations	X		X	X			X
1.3 across behavior-within situation	X		X		X	X	
1.4 across behaviors-across situations	X		X		X		X
2. Across individuals							
2.5 within behavior-within situation		X	X	X		X	
2.6 within behavior-across situations		X	X	X			X
2.7 across bheaviors-within situation		X	X		X	X	
2.8 across behaviors-across situations		X	X		X		X

* "Others" refers to other behaviors listed in Table 2 that are not defined as participation behaviors.

TABLE 5

Results of the Friedman two-way analysis of variance (X^2_R) for phase differences (Pre-test, post-test, and follow-up) in 15 behavioral categories for each group and situation.

GROUPS	Training Group		Exposure Group		Control Group	
SITUATIONS	French	Math.	French	Math.	French.	Math.
BEHAVIORS						
1. TP	7,00*	7,00*	1,79	7,71*	0,57	0,57
2. AD	6,58*	6,58*	5,36	8,00*	0,32	2,18
3. GW/IW	10,33	12,00*	6,00*	7,14*	17,71*	23,29*
4. GI/CI	4,33	10,33*	7,14*	14,00*	8,71*	21,32*
5. VP	3,00	7,00*	3,71	8,86*	1,00	1,29
6. NVP	4,00	0,00	1,89	3,43	8,32*	0,36
7. CN	10,33*	7,00*	12,29*	12,29*	21,57*	14,71*
8. TC	9,33*	4,00	3,71	6,00*	4,32	10,71*
9. OB	2,33	3,00	8,00*	5,43	0,57	4,43
10. AOC	10,33*	12,00*	12,29*	14,00*	10,86*	24,57*
11. DB	1,00	6,33*	0,86	1,14	6,14*	1,00
12. IIT	0,58	0,00	1,36	0,00	1,86	0,00
13. IPI	1,33	3,00	3,43	8,00*	3,57	21,00*
14. UBG/IOI	10,33*	1,00	5,43	3,71	7,00*	1,00
15. IOC	5,33	6,33*	8,00*	5,43	1,71	4,43

* $p < .052$

TABLE 6

Behavioral categories where significant Sign Test differences were observed for training ($p<.016$) exposure ($p<.008$), and control ($p<.05$) groups across situations and phases.

	Pre-Post	Post-follow	Pre-follow
French			
Training Group	TC+ AOC- GW/IW+	TP- UBG/IOI+ AD- CN+	TC+ GW/IW+ UBG/IOI+ AOC- CN+
Exposure Group	GI/CI+ IOC+ OB- AOC- GW/IW+	CN+	AOC- CN+
Control Group	AOC+ GW/IW- UBG/IOI-	CN+ UBG/IOI+ DB- GW/IW- AOC- GI/CI+	GW/IW- CN+ GI/CI+ NVP-
Mathematics			
Training Group	DB+ GI/CI- AOC+ GW/IW-	IOC+ AOC+ CN+ GW/IW- GI/CI-	TP+ AD+ VP+ GI/CI- AOC+ GW/IW-
Exposure Group	GI/CI- AOC+	TP+ GI/CI- CN+ AOC+	AD+ IPI- VP+ AOC+ GI/CI- CN+
Control Group	GI/CI- IPI- TC- AOC+ GW/IW-	IPI+ AOC+ CN+ GW/IW-	IPI- TC- GI/CI- AOC+ CN+ GW/IW-

* \+ indicates increased frequency of emission

\- indicates decreased frequency of emission

TABLE 7

F-values associated with relationships between pre-test and follow-up data from teacher ratings.

	FRENCH		MATHEMATICS	
VARIABLES	F =	p <	F =	p <
Treatment	13.38	0.0016	12.31	0.002
Treatment-related	1.16	0.3456	3.41	0.003
Inter-personal	2.18	0.0062	1.33	0.1691
Related to self	1.49	0.1457	1.57	0.1126
Task-related	1.77	0.0268	1.42	0.1017

TABLE 8

F-values for the analysis of covariance, comparing training (T), exposure (E), and control (C) groups in French and Mathematics situations on teacher-rated behavior categories previously found to be significant.

VARIABLES	GROUPS COMPARED	FRENCH F =	FRENCH p <	MATHEMATICS F =	MATHEMATICS p <
treatment behaviors	T-C	0.84	0.37	10.54	0.003
	E-C	2.25	0.15	0.15	0.69
treatment-related behaviors	T-C			3.21	0.05
	E-C			1.37	0.28
interpersonal behaviors	T-C	0.56	0.75		
	E-C	1.54	0.26		
task-related behaviors	T-C	0.70	0.68		
	E-C	0.55	0.78		